

ABSTRACT

A portable thermal imaging apparatus uses an ultrasonic acoustical source and an infrared camera to examine a flat or curved specimen such as the surface of the fuselage of an aircraft for defects such as subsurface disbonds, delaminations, cracks, corrosion, embedded contaminants, inclusions, and voids. The apparatus includes a base framework removably attachable to the specimen by a set of vacuum cups and a pair of guide rails along which the imaging apparatus can travel to allow multiple images to be captured without relocating the apparatus on the specimen. The acoustical signal from the ultrasonic source sweeps over a range of frequencies in order to excite defects of greatly differing size to exhibit local heating.